

**Amendments to the Claims**

This listing of claims will replace all prior versions, and listings, of claims in the application.

**Listing of Claims:**

1. (Currently Amended) A plasma processing apparatus comprising:  
a plasma chamber in which a high-density plasma is generated;  
a sample chamber in communication with the plasma chamber for housing a sample to be processed using the plasma; and  
a protection tube for protecting an inner wall of the plasma chamber from deposition of a product that results from the plasma processing, wherein  
the protection tube is inserted in the plasma chamber and comprises a plurality of pieces formed disposed in relation to a distribution of temperatures in the plasma chamber during the plasma processing,  
the plurality of pieces is disposed in an axial direction of the protection tube, and  
each of the plurality of pieces is shorter in axial length than a piece disposed at a location where a gradient of the temperatures during the plasma processing is smaller.
  
2. (Previously Presented) The plasma processing apparatus according to Claim 1, wherein  
the plasma chamber is tubular in shape,  
the protection tube is tubular in shape, and  
each of the plurality of pieces is a tubular member.

3. (Cancelled)

4. (Original) The plasma processing apparatus according to Claim 1, wherein the protection tube is provided with at least one groove formed on an inner wall thereof in parallel with an axis of the protection tube.

5. (Original) The plasma processing apparatus according to Claim 1, wherein the protection tube is provided with a plurality of grooves formed on the inner wall thereof in parallel with an axis of the protection tube at substantially equal circumferential intervals.

6. (Original) The plasma processing apparatus according to Claim 1, wherein the protection tube is made of quartz.

7. (Original) The plasma processing apparatus according to Claim 1, wherein the sample is subjected to sputtering using the plasma.

8. (Original) The plasma processing apparatus according to Claim 1, wherein the plasma is an electron cyclotron resonance plasma.

9. (Original) The plasma processing apparatus according to Claim 1, wherein the plasma is an inductively coupled plasma.

10. (Original) The plasma processing apparatus according to Claim 1, wherein the plasma is a helicon wave plasma.

11. (Currently Amended) A plasma processing apparatus comprising:

a plasma chamber in which a high-density plasma is generated;

a sample chamber in communication with the plasma chamber for housing a sample to be processed using the plasma; and

a protection tube for protecting an inner wall of the sample chamber from deposition of a product that results from the plasma processing, wherein

the protection tube is inserted in the sample chamber and comprises a plurality of pieces formed disposed in relation to a distribution of temperatures in the sample chamber during the plasma processing,

the plurality of pieces is disposed in an axial direction of the protection tube, and

each of the plurality of pieces is shorter in axial length than a piece disposed at a location where a gradient of the temperatures during the plasma processing is smaller.

12. (Previously Presented) The plasma processing apparatus according to Claim 11, wherein

the sample chamber is tubular in shape,

the protection tube is tubular in shape, and

each of the plurality of pieces is a tubular member.

13. (Cancelled)

14. (Original) The plasma processing apparatus according to Claim 11, wherein the protection tube is provided with at least one groove formed on an inner wall thereof in parallel with an axis of the protection tube.
15. (Original) The plasma processing apparatus according to Claim 14, wherein the protection tube is provided with a plurality of grooves formed on the inner wall thereof in parallel with an axis of the protection tube at substantially equal circumferential intervals.
16. (Original) The plasma processing apparatus according to Claim 11, wherein the protection tube is made of quartz.
17. (Original) The plasma processing apparatus according to Claim 11, wherein the sample is subjected to etching using the plasma.
18. (Original) The plasma processing apparatus according to Claim 11, wherein the sample is subjected to chemical vapor deposition using the plasma.
19. (Original) The plasma processing apparatus according to Claim 11, wherein the plasma is an electron cyclotron resonance plasma.
20. (Original) The plasma processing apparatus according to Claim 11, wherein the plasma is an inductively coupled plasma.

21. (Original) The plasma processing apparatus according to Claim 11, wherein the plasma is a helicon wave plasma.

22. (Cancelled)

23. (Cancelled)

24. (New) A plasma processing apparatus comprising:  
a plasma chamber in which a high-density plasma is generated;  
a sample chamber in communication with the plasma chamber for housing a sample to be processed using the plasma; and  
a protection tube comprising a plurality of pieces disposed in the plasma chamber for protecting an inner wall of the plasma chamber from deposition of a product that results from plasma processing, wherein  
each of the plurality of pieces is so coupled to another piece so as not to prevent expansion of the other piece.